REMARKS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-24 are pending active examination. Claims 1 and 24 are amended to provide a clearer presentation of the claimed subject matter. Applicant submits that no new matter has been added. Claim 2 is canceled without prejudice or disclaimer. Claims 25-31 are withdrawn from consideration as being drawn to non-elected inventions. No new claims have been added.

In the outstanding Office Action, the Examiner has rejected Claim 24 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. 2003/0164226 to Mandrekar et al. The Examiner has rejected Claims 1-13, 15, 18 and 21-24 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0164226 to Mandrekar et al. The Examiner has rejected Claims 1-13, 15, 18 and 21-24 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,026,896 to Hunter (hereinafter Hunter) in view of U.S. Patent Application Publication No. 2003/0164226 to Mandrekar et al. The Examiner has rejected Claims 1-5, 9-11, 14-16 and 20-24 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,802,856 to Schaper et al. (hereinafter Schaper et al.) in view of U.S. Patent Application Publication No. 2003/0164226 to Mandrekar et al. The Examiner has rejected Claims 12-14 and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over Hunter in view of U.S. Patent Application Publication No. 2003/0164226 to Mandrekar et al. and in further view of U.S. Patent Application Publication No. 2003/0164226 to Kanno et al. (hereinafter Kanno et al.). The Examiner has rejected Claims 6-8 under 35 U.S.C. § 103(a) as being unpatentable over Hunter in view of U.S. Patent Application Publication No. 2003/0164226 to Mandrekar et al. and in further view of U.S. Patent No. 4,060,997 to Shultz et al. (hereinafter Shultz et al.).

The reference cited as "U.S. Patent Application Publication No. 2003/0164226 to Mandrekar et al." appears to be in error. This U.S. Patent Application Publication No. 2003/0164226 pertains to Kanno et al. as also cited in the above rejections. Since the citation that possesses an error is common to all of the rejections provided above, Applicant asserts that each rejection is improper. Applicant attempted to contact the Examiner via telephone, but did not reach the Examiner and left a message. Applicant respectfully requests that the

Office sets a new period for reply to substantially equal the time remaining in the reply period.

Applicant believes the citation in error is U.S. Patent No. 6,117,245 to Mandrekar et al. (hereinafter Mandrekar et al.), which is a reference cited in an earlier Office communication. If this assertion is correct, then Applicant respectfully disagrees with each of these rejections and, therefore, respectfully traverses the same, for the reasons presented below.

Turning now to the merits, with respect to the rejection under 35 U.S.C. § 102(b), Claim 24 is not anticipated by Mandrekar et al. since this claim, as presently amended, recites a distributed temperature control system for controlling a temperature of a plurality of equipment, each of the plurality of equipment having a channel that carries a heat-transfer fluid, the system comprising, *inter alia*,

> an outlet flow control unit, including ***a mixing unit***, that is in fluid communication with the channel of each of the plurality of equipment and the first and second fluid units, the outlet flow control unit being constructed and arranged to supply the channel of each of the plurality of equipments with the controlled heat transfer fluid comprising at least one of the heat-transfer fluid having a first temperature, the heat transfer fluid having a second temperature or a combination thereof;
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> ***an inlet distribution unit that is in fluid communication with the channel of each of the plurality of equipments and the first and second fluid units, the inlet distribution unit being constructed and arranged to control a volume, a flow rate, or combination thereof of the controlled heat transfer fluid returning from the channel of each of the plurality of equipments and flowing to the first fluid unit and control a volume, a flow rate, or combination thereof of controlled heat transfer fluid returning from the channel of each of the plurality of equipments and flowing to the second fluid unit***; and
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> said mixing unit comprising ***a mixing flow chamber having a mixing flow surface, wherein the heat transfer-fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber***. [***Emphasis added.***]

The distributed temperature control system, as presently amended, provides an arrangement that allows the controlled heat transfer fluid to return from the channel of each of the plurality of equipments to the first and second fluid units. Moreover, the distributed temperature control system, as presently amended, provides an arrangement that allows the control of a volume, a flow rate, or combination thereof of the controlled heat transfer fluid

returning from the channel of each of the plurality of equipments and flowing to the first fluid unit and the control of a volume, a flow rate, or combination thereof of controlled heat transfer fluid returning from the channel of each of the plurality of equipments and flowing to the second fluid unit. In doing so, the return of the controlled heat transfer fluid to the first and second fluid units may controllably replenish in part or in full the depletion of the respective heat transfer fluid in the first and second fluid units due to the supply of heat transfer fluid at a first temperature from the first fluid unit, or the supply of the heat transfer fluid at a second temperature from the second fluid unit, or both to the channel of each of the plurality of equipments.

Mandrekar et al. provides an apparatus for regulating temperature of a component of a processing chamber. The apparatus comprises a cooling fluid supply 50 and a heating fluid supply 52 configured to provide a cooling fluid and a heating fluid, respectively, to a thermal fluid supply inlet 32 that is coupled to a thermal conductor thermally connected to a component in a processing chamber. However, Mandrekar et al. fails to teach or suggest an inlet distribution unit as presently claimed. The cooling fluid and the heating fluid provided by the cooling fluid supply 50 and the heating fluid supply 52, respectively, are not returned to the cooling fluid supply 50 and the heating fluid supply 52. Rather, the thermal fluid resulting from the supply of cooling fluid and heating fluid from the cooling fluid supply 50 and the heating fluid supply 52, respectively, is pumped out of the system through exhaust port 34 to the thermal fluid exhaust [Column 6, Lines 6-10]. Mandrekar et al. teaches away from an inlet distribution unit as presently claimed.

The Examiner maintains that Mandrekar et al. discloses that the valve 64 mixes the two flows [Column 6, Lines 29-31]. However, Mandrekar et al. merely states that the cooling fluid supply 50 and the heating fluid supply 52 provide respective fluids to a control valve so that the temperature of the thermal fluid mixture resulting from the control valve is dependent only on the proportion of the heating and cooling fluids. There is no recitation or suggestion in Mandrekar et al. of a mixing unit, much less a mixing unit comprising a mixing flow chamber having a mixing flow surface, wherein the heat-transfer fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber, as required by independent Claim 24.

Additionally, the Examiner asserts that, inherently, valve 64 has several surfaces which help mechanical mixing. The Examiner does not provide any extrinsic evidence to

show the asserted inherent element would be so recognized by persons of ordinary skill in the art.

"To serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with recourse to extrinsic evidence. Such evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill". *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991).

Furthermore, if an element is inherently disclosed, "it must be necessarily present and a person of ordinary skill in the art would recognize it presence". *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999); *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d at 1268, 20 USPQ2d at 1749 (Fed. Cir. 1991); (quoting *Crown Operations International, LTD., v. Solutia Inc.*, 289 F.3d 1367, 62 USPQ2d (BNA) 1917). Inherency "may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient". *Id.* at 1269, 20 USPQ2d at 1749 (quoting *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981)).

The asserted inherent element is not necessarily present. Furthermore, inherency may not be established by assuming that internal surfaces of the valve 64 cause the heat-transfer fluid having a first temperature and the heat-transfer fluid having a second temperature to be mechanically mixed.

Therefore, since Mandrekar et al. fails to teach each and every element in currently amended Claim 24, Applicant respectfully submits that Claim 24 is not anticipated by Mandrekar et al. Accordingly, immediate withdrawal of the prior art rejection of Claim 24 is respectfully requested.

With respect to the rejection of Claims 1-13, 15, 18 and 21-24 under 35 U.S.C. § 103(a) as being unpatentable over Mandrekar et al., Claims 1-13, 15, 18 and 21-24 are patentable over Mandrekar et al. since these claims, as presently amended, recite an apparatus for controlling a temperature of a substrate, the substrate having a lower surface and an upper surface on which a substrate processing is performed, the apparatus comprising, *inter alia*,

> an outlet flow control unit, including ***a mixing unit***, that is in fluid communication with the channel of each of the plurality of equipment and the first and second fluid units, the outlet flow control unit being constructed and arranged to supply the channel of each of the plurality of equipments with the controlled heat transfer fluid comprising at least one of the heat-transfer fluid having a first temperature, the heat transfer fluid having a second temperature or a combination thereof;
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> ***an inlet distribution unit that is in fluid communication with the channel of the thermal assembly and the first and second fluid units, the inlet distribution unit being constructed and arranged to control a volume, a flow rate, or combination thereof of controlled heat transfer fluid returning from the channel of the thermal assembly and flowing to the first fluid unit and control a volume, a flow rate, or combination thereof of controlled heat transfer fluid returning from the channel of the thermal assembly and flowing to the second fluid unit***; and
>
> said mixing unit comprising ***a mixing flow chamber having a mixing flow surface, wherein the heat transfer-fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber***. [***Emphasis added.***]

and recite a distributed temperature control system for controlling a temperature of a plurality of equipment, each of the plurality of equipment having a channel that carries a heat-transfer fluid, the system comprising, *inter alia*,

> an outlet flow control unit, including ***a mixing unit***, that is in fluid communication with the channel of each of the plurality of equipment and the first and second fluid units, the outlet flow control unit being constructed and arranged to supply the channel of each of the plurality of equipments with the controlled heat transfer fluid comprising at least one of the heat-transfer fluid having a first temperature, the heat transfer fluid having a second temperature or a combination thereof;
>
> ***an inlet distribution unit that is in fluid communication with the channel of each of the plurality of equipments and the first and second fluid units, the inlet distribution unit being constructed and arranged to control a volume, a flow rate, or combination thereof of the controlled heat transfer fluid returning from the channel of each of the plurality of equipments and flowing to the first fluid unit and control a volume, a flow rate, or combination thereof of controlled heat transfer fluid returning from the channel of each of the plurality of equipments and flowing to the second fluid unit***; and
>
> said mixing unit comprising ***a mixing flow chamber having a mixing flow surface, wherein the heat transfer-fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber***. [***Emphasis added.***]

As set forth above, Mandrekar et al. fails to teach or suggest an inlet distribution unit as presently claimed. In fact, Mandrekar et al. teaches away from an inlet distribution unit as presently claimed. Further, as set forth above, Mandrekar et al. fails to teach or suggest a

mixing unit, much less a mixing unit comprising a mixing flow chamber having a mixing flow surface, wherein the heat-transfer fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber.

Since Mandrekar et al. fails to teach each and every element in currently amended Claims 1 and 24, Applicant respectfully submits that Claims 1 and 24 patentably distinguish over Mandrekar et al. Additionally, since Claims 2-13, 15 and 18 depend from Claim 1, either directly or indirectly, Applicant respectfully submits that Claims 2-13, 15 and 18 patentably distinguish over Mandrekar et al. Accordingly, immediate withdrawal of the prior art rejection of Claims 1-13, 15, 18 and 21-24 is respectfully requested.

With respect to the rejection of Claims 1-13, 15, 18 and 21-24 under 35 U.S.C. § 103(a) as being unpatentable over Hunter in view of Mandrekar et al., Claims 1-13, 15, 18 and 21-24 are patentable over the cited references at least for the reasons set forth above and for the reason that Hunter fails to cure the noted deficiencies of Mandrekar et al. Hunter describes a temperature control system for semiconductor processing facilities, wherein a three-way valve is used to provide an option of using fluid from either of two manifolds for distribution of heat transfer fluids at different temperatures to multiple components of multiple process units. Hunter fails to teach or suggest an inlet distribution unit as presently claimed. Further, Hunter fails to teach or suggest a mixing unit, much less a mixing unit comprising a mixing flow chamber having a mixing flow surface, wherein the heat-transfer fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber.

Since Hunter in view of Mandrekar et al. fails to teach each and every element in currently amended Claims 1 and 24, Applicant respectfully submits that Claims 1 and 24 patentably distinguish over Hunter in view of Mandrekar et al. Additionally, since Claims 2-13, 15, 18 and 21-23 depend from Claim 1, either directly or indirectly, Applicant respectfully submits that Claims 2-13, 15, 18 and 21-23 patentably distinguish over Hunter in view of Mandrekar et al. Accordingly, immediate withdrawal of the prior art rejection of Claims 1-13, 15, 18 and 21-24 is respectfully requested.

With respect to the rejection of Claims 1-5, 9-11, 14-16 and 20-24 under 35 U.S.C. § 103(a) as being unpatentable over Schaper et al. in view of Mandrekar et al., Claims 1-5, 9-11, 14-16 and 20-24 are patentable over the cited references at least for the reasons set forth

above and for the reason that Schaper et al. fails to cure the noted deficiencies of Mandrekar et al. Schaper et al. describes a multizone bake/chill thermal cycling module, wherein a substrate is baked and chilled through thermal contact with thermally conductive plates 34, an array of thermoelectric devices (TEDs) 36, and a heat exchanger 38. Schaper et al. fails to teach or suggest an inlet distribution unit as presently claimed. Further, Schaper et al. fails to teach or suggest a mixing unit, much less a mixing unit comprising a mixing flow chamber having a mixing flow surface, wherein the heat-transfer fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber.

Since Schaper et al. in view of Mandrekar et al. fails to teach each and every element in currently amended Claims 1 and 24, Applicant respectfully submits that Claims 1 and 24 patentably distinguish over Schaper et al. in view of Mandrekar et al. Additionally, since Claims 2-5, 9-11, 14-16 and 20-23 depend from Claim 1, either directly or indirectly, Applicant respectfully submits that Claims 2-5, 9-11, 14-16 and 20-23 patentably distinguish over Schaper et al. in view of Mandrekar et al. Accordingly, immediate withdrawal of the prior art rejection of Claims 1-5, 9-11, 14-16 and 20-24 is respectfully requested.

With respect to the rejection of Claims 12-14 and 17-19 under 35 U.S.C. § 103(a) as being unpatentable over Hunter in view of Mandrekar et al. and in further view of Kanno et al., Claims 12-14 and 17-19 are patentable over the cited references at least for the reasons set forth above and for the reason that Kanno et al. fails to cure the noted deficiencies of Mandrekar et al. and Hunter. Kanno et al. describes the use of temperature adjusting grooves formed in a wafer stage to cool the wafer. Kanno et al. fails to teach or suggest an inlet distribution unit as presently claimed. Further, Kanno et al. fails to teach or suggest a mixing unit, much less a mixing unit comprising a mixing flow chamber having a mixing flow surface, wherein the heat-transfer fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber.

Since Hunter in view of Mandrekar et al. and in further view of Kanno et al. fails to teach each and every element in Claims 12-14 and 17-19, Applicant respectfully submits that Claims 12-14 and 17-19 patentably distinguish over Hunter in view of Mandrekar et al. and in further view of Kanno et al. Accordingly, immediate withdrawal of the prior art rejection of Claims 12-14 and 17-19 is respectfully requested.

With respect to the rejection of Claims 6-8 under 35 U.S.C. § 103(a) as being unpatentable over Hunter in view of Mandrekar et al. and in further view of Shultz et al., Claims 6-8 are patentable over the cited references at least for the reasons set forth above and for the reason that Shultz et al. fails to cure the noted deficiencies of Mandrekar et al. and Hunter. Shultz et al. describes a water chiller control in which a thermal sensor for a return temperature provides effective thermal control. Shultz et al. fails to teach or suggest an inlet distribution unit as presently claimed. Further, Shultz et al. fails to teach or suggest a mixing unit, much less a mixing unit comprising a mixing flow chamber having a mixing flow surface, wherein the heat-transfer fluid having a first temperature and the heat-transfer fluid having a second temperature are mechanically mixed within said mixing flow chamber.

Since Hunter in view of Mandrekar et al. and in further view of Shultz et al. fails to teach each and every element in Claims 6-8, Applicant respectfully submits that Claims 6-8 patentably distinguish over Hunter in view of Mandrekar et al. and in further view of Shultz et al. Accordingly, immediate withdrawal of the prior art rejection of Claims 6-8 is respectfully requested.

CONCLUSIONS

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal allowance. An early and favorable action is therefore respectfully requested.

Should the Examiner have any questions or deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

Charge Deposit Account

Please charge our Deposit Account No. 50-3451 for any additional fee(s) that may be due in this matter, and please credit the same deposit account for any overpayment.

Respectfully submitted,

/Eric Strang/

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ERIC STRANG
Agent of Record
Registration No. 54,472
Tel. No. 480.539.2109
Fax No.: 480.539.2100

Date: January 18, 2008

TOKYO ELECTRON U.S. HOLDINGS
4350 W Chandler Blvd., Suite 10
Chandler, AZ 85226
Tel. No.: (480) 539-2109